

Chapter 2: Components of an Effective IDDE Program

The prospect of developing and administering an IDDE program can be daunting, complex and challenging in many communities. This Chapter organizes and simplifies the basic tasks needed to build a program. In general, a community should consider eight basic program components, as follows:

1. Audit Existing Resources and Programs

– The first program component reviews existing local resources, regulations, and responsibilities that bear on illicit discharge control in the community. A systematic audit defines local needs and capabilities, and provides the foundation for developing the initial IDDE program plan over the first permit cycle.

2. Establish Responsibility, Authority and Tracking

– This component finds the right “home” for the IDDE program within existing local departments and agencies. It also establishes the local legal authority to regulate illicit discharges, either by amending an existing ordinance, or crafting a new illicit discharge ordinance. This program component also involves creation of a tracking system to report illicit discharges, suspect outfalls, and citizen complaints, and to document local management response and enforcement efforts.

3. Complete a Desktop Assessment of Illicit Discharge Potential

– Illicit discharges are not uniformly distributed across a community, but tend to be clustered within certain land uses, subwatersheds, and sewage infrastructure eras. This program component helps narrow your search for the most severe illicit discharge problems,

through rapid analysis of existing mapping and water quality monitoring data.

4. Develop Program Goals and Implementation Strategies

– This program component integrates information developed from the first three program components to establish measurable goals for the overall IDDE program during the first permit cycle. Based on these goals, managers develop specific implementation strategies to improve water quality and measure program success.

5. Search for Illicit Discharge Problems in the Field

– This component involves rapid outfall screening to find problem outfalls within priority subwatersheds. Results of outfall surveys are then used to design a more sophisticated outfall monitoring system to identify flow types and trace discharge sources. Many different monitoring options exist, depending on local needs and discharge conditions.

6. Isolate and Fix Individual Discharges

– Once illicit discharge problems are found, the next step is to trace them back up the pipe to isolate the specific source or improper connection that generates them. Thus, this program component improves local capacity to locate specific discharges, make needed corrections, and take any enforcement actions.

7. Prevent Illicit Discharges

– Many transitory and intermittent discharges are produced by careless practices at the home or workplace. This important program component uses a combination of education and enforcement to promote better

pollution prevention practices. A series of carrots and sticks is used to reach out to targeted individuals to prevent illegal or unintentional illicit discharges.

8. Evaluate the Program – The last component addresses the ongoing management of the IDDE program. The measurable goals set for the IDDE program are periodically reviewed and revisited to determine if progress is being made, or implementation strategies need to be adjusted.

Within each program component, a community has many options to choose, based on its size, capability and the severity of its illicit discharge problems. Chapters 3 through 10 address each IDDE program component in more detail, and summarize

its purpose, methods, desired product or outcome, and budget implications. The remainder of each chapter provides program managers with detailed guidance to choose the best options to implement the program component in their community.

Scheduling of the eight IDDE program components is not always sequential and may overlap in some cases. In general, the first four program components should be scheduled for completion within the first year of the permit cycle in order to develop an effective program for the remaining years of the permit. Table 4 summarizes the specific tasks and products associated with each IDDE program component. The scheduling, costs and expertise needed for each IDDE program component are compared in Table 5.

Program Component	Key Tasks	Products
1. Audit existing programs	<ul style="list-style-type: none"> • Infrastructure Profile • Existing Legal Authority • Available Mapping • Experienced Field Crews • Access to Lab Services • Education and Outreach Outlets • Discharge Removal Capability • Program Budget and Financing 	<ul style="list-style-type: none"> • Agreement on Lead Agency • 5 year Program Development Plan • First Year Budget and Scope of Work
2. Establish responsibility and authority	<ul style="list-style-type: none"> • Review Existing Ordinances • Define “Illicit” • Provisions for Access/Inspections • Select Enforcement Tools • Design Tracking System 	<ul style="list-style-type: none"> • Adopt or Amend Ordinance • Implement Tracking System
3. Desktop assessment of illicit discharge potential	<ul style="list-style-type: none"> • Delineate Subwatersheds • Compile Mapping Layers/Data • Define Discharge Screening Factors • Screen Subwatersheds for Illicit Discharge Potential • Generate Maps for Field Screening 	<ul style="list-style-type: none"> • Prioritize Subwatersheds for Field Screening
4. Develop program goals and strategies	<ul style="list-style-type: none"> • Community Analysis of Illicit Discharge • Public Involvement 	<ul style="list-style-type: none"> • Measurable Program Goals • Implementation Strategies

Table 4: Key Tasks and Products in IDDE Program Implementation

Program Component	Key Tasks	Products
5. Search for illicit discharges problems in the field	<ul style="list-style-type: none"> • Outfall Reconnaissance Inventory (ORI) • Integrate ORI data in Tracking System • Follow-up Monitoring at Suspect Outfalls 	<ul style="list-style-type: none"> • Initial Storm Drain Outfall Map • Develop Monitoring Strategy
6. Isolate and fix individual discharges	<ul style="list-style-type: none"> • Implement Pollution Hotline • Trunk and On-site Investigations • Corrections and Enforcement 	<ul style="list-style-type: none"> • Maintain Tracking System
7. Prevent illicit discharges	<ul style="list-style-type: none"> • Select Key Discharge Behaviors • Prioritize Outreach Targets • Choose Effective Carrots and Sticks • Develop Budget and Delivery System 	<ul style="list-style-type: none"> • Implement Residential, Commercial, Industrial or Municipal Pollution Prevention Programs
8. Program evaluation	<ul style="list-style-type: none"> • Analyze Tracking System • Characterize Illicit Discharges Detected • Update Goals and Strategies 	<ul style="list-style-type: none"> • Annual Reports • Permit Renegotiation

Table 5: Comparison of IDDE Program Components

IDDE Program Component	When To Do It	Startup Costs	Annual Cost	Expertise Level	Type of Expertise
1. Audit	Immediately	\$	-0-	??	Planning/Permitting
2. Authority	Year 1	\$\$	\$??	Legal
3. Desktop Analysis	Year 1	\$\$	-0-	???	GIS
4. Goals/Strategies	Year 1	\$	-0-	??	Stakeholder Management
5. Field Search/Monitoring	Year 2 to 5	\$\$	\$\$\$\$???	Monitoring
6. Isolate and Fix	Year 2 to 5	\$	\$\$???	Pipe and Site Investigations
7. Prevention	Year 2 to 5	\$\$	\$\$\$??	Education
8. Evaluation/Tracking	Annually	-0-	\$?	Data Analysis
Key: \$ = <\$10,000 ? - Simple \$\$ = \$10,000 - 25,000 ?? - Moderately Difficult \$\$\$ = \$25,000 - 50,000 ??? - Complex \$\$\$\$ = > \$50,000					

2.1 Management Tips To Develop an Effective IDDE Program

Every community will develop a unique IDDE program that reflects its size, development history, land use, and infrastructure. Still, some common threads run through effective and well-managed local IDDE programs. Below are some tips on building an effective local.

1. Go after continuous sewage discharges first. Effective programs place a premium on keeping sewage out of the storm drain system. Continuous sewage discharges pose the greatest threat to water quality and public health, produce large pollutant loads, and can generally be permanently corrected when the offending connection is finally found. Intermittent or indirect discharges are harder to detect, and more difficult to fix.

2. Put together an interdisciplinary and interagency IDDE development team. A broad range of local expertise needs to be coordinated to develop the initial IDDE plan, as indicated in Table 5. Effective programs assemble an interagency program development team that possesses the diverse skills and knowledge needed for the program, ranging from legal analysis, GIS, monitoring, stakeholder management and pipe repairs.

3. Educate everybody about illicit discharges. Illicit discharge control is a new and somewhat confusing program to the public, elected officials, and many local agencies. Effective programs devote considerable resources to educate all three groups about the water quality impacts of illicit discharges.

4. Understand your infrastructure. Finding illicit discharges is like finding a needle in a haystack on a shoestring budget. Many indirect or transitory discharges are extremely difficult to catch through outfall screening. Therefore, effective programs seek to understand the history and condition of their storm water and sewer infrastructure to find the combinations that create the greatest risk for illicit discharge. Effective programs also screen land uses to locate generating sites within targeted subwatersheds. For example, knowing the proximity of the infrastructure to the groundwater table or knowing that the sewer collection system has a long transit time can influence the indicator parameters and associated thresholds that a community chooses to target.

5. Walk all of your streams in the first permit cycle. Perform a rapid Outfall Reconnaissance Inventory (ORI) on every mile of stream or channel in the community, starting with the subwatersheds deemed to

have the greatest risk. The ORI allows you to rapidly develop an accurate outfall map and quantify the severity of your discharge problems. ORI data and field photos are extremely effective in documenting local problems. Stream walks and the ORI should be conducted regularly as part of an IDDE program. In many areas, it may require as many as three stream walks to identify all outfall locations.

6. Use GPS to create your outfall map. In most communities, the storm water system and sewer pipe networks are poorly mapped, and consist of a confusing blend of pipes and structures that were constructed in many different eras. Effective programs perform a field reconnaissance to ground truth the precise locations of all outfalls using GPS technologies. Effective programs have learned to quickly evaluate outfalls of all sizes, and not just major ones (>36 inches in diameter).

7. Understand your discharges before developing a monitoring plan. Monitoring is usually the most expensive component of any local IDDE program, so it is extremely important to understand your discharges before committing to a particular monitoring method or tracer. Compiling a simple discharge “fingerprint” library that characterizes the chemistry of major flow types in the community (e.g., sewage, septage, washwater, groundwater, tap water, or non-target irrigation water) is recommended. This library can distinguish flow types and adjust monitoring benchmarks.

8. Consider establishing an ambient (in-stream) chemical and/or biological monitoring program. Prioritizing outfall screening and investigation can save time in the field. An ambient chemical or biological monitoring program can provide supplemental

information to help prioritize sites and can be used to document long-term success.

9. Utilize a simple outfall tracking system to organize all your IDDE program data. Illicit discharges are hard enough to find if an organized system to track individual outfalls is lacking. Effective programs develop a unified geospatial tracking system to locate each outfall, and store information on its address, characteristics, photos, complaints and monitoring data. The tracking system should be developed early in the permit cycle so that program managers can utilize it as an evaluation and reporting tool.

10. Outsource some IDDE functions to local watershed groups. Staffing is the greatest single line item expense associated with a local IDDE program, although staffing needs are often temporary or seasonal in nature. Some effective programs have addressed this staffing imbalance by contracting with watershed groups to screen outfalls, monitor stream quality, and handle storm water education. This strategy reduces overall program costs, and increases local watershed awareness and stewardship.

11. Utilize a hotline as an education and detection tool. Citizen hotlines are a low-cost strategy to engage the public in illicit discharge surveillance, and are probably the only effective way to pick up intermittent and transitory discharges that escape outfall screening. When advertised properly, hotlines are also an effective tool to increase awareness of illicit discharges and dumping. Effective programs typically respond to citizen reports within 24 hours, acknowledge their help, and send them storm water education materials. When citizens play a stronger role in reporting illicit discharge problems, local staff can focus their efforts on tracing the problem to its source and fixing it.

12. Cross-train all local inspectors to recognize discharges and report them for enforcement. Effective programs make sure that fire, building, plumbing, health, safety, erosion control and other local inspectors understand illicit discharges and know whom to contact locally for enforcement.

13. Target your precious storm water education dollars. Most programs never have enough resources to perform the amount of storm water education needed to reduce indirect and transitory discharges in their community. Consequently, effective programs target their discharges of concern, and spend their scarce dollars in the subwatersheds, neighborhoods or business sectors most likely to generate them.

14. Stress public health and safety benefits of sewage-free streams. Effective programs publicize the danger of sewage discharges, and notify the public and elected officials about the discharges that need to be prevented or corrected.

15. Calibrate your program resources to the magnitude of the illicit discharge problem. After a few years of analysis and surveys, communities get a good handle on the actual severity of their illicit discharge problems. In some communities, storm drains will be relatively clean, whereas others may have persistent problems. Effective programs are flexible and adaptive, and shift program resources to the management measure that will reduce the greatest amount of pollution.

16. Think of discharge prevention as a tool of watershed restoration. Discharge prevention is considered one of the seven primary practices used to restore urban watersheds (Schueler, 2004). Effective programs integrate illicit discharge control as a part of a comprehensive effort to restore local watersheds.

